

Abstract

The present invention is directed to a swivel joint for fluid conduits which comprises a central axis; a tubular male member having an outer annular surface, a first end and at least first and second outer annular grooves formed on
 5 the outer surface coaxial with the central axis; a tubular female member having an inner annular recess, an annular shoulder formed at an inner end of the recess and at least first and second inner annular grooves formed on the recess coaxial with the central axis; wherein the outer surface of the male member is
 10 adapted to be received in the recess of the female member such that the first end is disposed proximate the shoulder and each outer groove is aligned with a corresponding inner groove to thereby define at least first and second annular races; a plurality of balls disposed in each race to secure said male and female
 15 members together and to facilitate relative rotation of the male and female members about the central axis; wherein the radius of each race as measured from the central axis is greater than the radius of each adjacent race closer to the first end of the male member; and wherein the number of balls in each race is one more than the number of balls in each adjacent race closer to the first end.